NHDOT SPR2 PROGRAM
RESEARCH PROGRESS REPORT

Project # SPR 26962Y		**Report Period** Year 2020 ☐ Q1 (Jan-Mar) X Q2 (Apr-Jun) ☐Q3 (Jul-Sep) ☐ Q4 (Oct-Dec)
Project Title: Assessment of Embedded Culvert Low Flow Hydraulics		
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Project Start Date: May 1, 2019	**Project End Date:** April 30, 2021	**Project schedule status:** X On schedule ☐ Ahead of schedule ☐ Behind schedule

Brief Project Description:

The proposed research has two fundamental thrusts: to field study constructed embedded culverts in NH, and a thorough literature review. The project will begin with a TAG kickoff meeting to provide context for the study and to fine tune the scope. The office portion of the research will begin with the literature review. Lines of communication (phone, e-mail) will also be opened with regulating entities in other states (in neighboring states and Pacific northwest and Alaska) to solicit their experiences with embedded culverts. This will include gathering design specifications from those jurisdictions. The research team will also collect and sift through the technical guidance documents for other states, FHWA, and countries and compare to NH guidance. The construction community will be interviewed to determine if there are limitations in the supply or placement of the embedment material available in New Hampshire. NH DOT will provide a list of its embedded culverts and NH DES can augment the list with permitted and constructed non-DOT structures. NH DOT personnel will be interviewed to determine where they have installed embedded culverts and to collect their design plans. The NHDES permit database will also be searched for all embedded culverts installed in New Hampshire. The embedded culverts from the DOT and DES sources will all be targeted for field visits. Knowledge of the location of each culvert will allow investigation into watershed and hydrologic characteristics at the site of each culvert. These characteristics will be documented via online resources such as StreamStats and GRANIT. The DOT and DES culvert databases will also yield embedded culvert metadata such as: year constructed, embedment particles size distribution, embedment depth, etc.

Progress this Quarter (include meetings, installations, equipment purchases, significant progress, etc.):

The past quarter efforts included: collecting the particle size distributions from the design plans; particle size distribution analysis of collected in-culvert sediments; seeking additional embedded culverts to include in the study; a TAG meeting; and planning for the upcoming field season.

Items needed from NHDOT (i.e., Concurrence, Sub-contract, Assignments, Samples, Testing, etc.):

No urgent needs, but updates on any newly installed embedded culverts.

Anticipated research next three (3) months:

The next 3 months will be the second and final field season. We plan to: visit the remaining and new stream crossing installations; streamgage; and; synthesize data to date. Also, agency contacts from other states will be contacted and information gathered on embedment approaches, designs, and performance in their states.

Circumstances affecting project:

The most dramatic circumstance was that UNH shut down all research and travel the middle of March 2020 and allowed very slow re-opening by the end of May 2020. This has limited what we were able to complete. This project was able to ramp back up the very end of June 2020.

Budget, scope, and timing are all on schedule. One other circumstance out of our hands is having Mother Nature cooperate with low flows. The summer 2019 was not particularly dry, and as such, only six culverts were stream gaged to date. At this writing, June 2020 was incredibly dry and therefore we may be able to be successful in streamgaging all

culverts in our database should this weather pattern hold-out.

Tasks (from Work Plan)	Planned % Complete	Actual % Complete
Task 1 Kickoff meeting	100%	100%
Task 2 Field Efforts	55%	35%
Task 3 Review of other Technical Guidance	25%	15%